

Appl. No. 10/558,719
Response to Office Action of July 24, 2008

PATENT
Docket No.: NL030649US1
Customer No. 000024737

Amendment to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (currently amended) An opto-electronic input device (10), wherein the input is formed by detected movements of an object (M), which input device is provided with an optical module (11) comprising at least one laser (1) with a resonant cavity for generating a measurement radiation beam (S), optical means (2) for guiding the radiation beam (S) to a plate (V) close to the object (M), and conversion means (C) for converting radiation from the measurement radiation beam (S), which is reflected by the object (M), into an electric signal, wherein the conversion means (C) are formed by the combination of the resonant cavity of the laser (1) and measurement means (3) for measuring a change in the resonant cavity during operation, which change is caused by interference of the reflected radiation from the measurement radiation beam (S), which penetrates the resonant cavity, and the standing wave in the resonant cavity, and which is representative of a relative movement of the object (M) with respect to the module (11), wherein the optical module (11) comprises the laser (1) mounted on a carrier plate (4), and the optical means (2) comprise an optical component (2) mounted on the carrier plate (4) and aligned with the laser (1), from which optical component the measurement radiation beam (S) emitted by the laser (1) travels to the plate (V) close to the object (M), ~~characterized in that wherein~~ the plate (V) comprises, close to the object (M), a first portion (V1) that comprises an upper surface of a transparent block-shaped body which is situated within a projection of the object (M), wherein the transparent block-shaped body (i) is configured to enable and allows passage of the radiation beam (S) upon entering near a lower side and through multiple internal reflections against sidewalls of the transparent block-shaped body to the upper surface of the transparent block-shaped body and (ii) is situated in a fixed position with respect to the carrier plate (4) in that the transparent block-shaped body is mounted onto the carrier plate, as well as a

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second portion (V2) which is situated within a projection of the object (M) and is movable in a direction perpendicular to the carrier plate, wherein the second portion (V2) (4) and comprises signaling means which, in the case of response to movement of the second portion (V2) in the direction perpendicular to the carrier plate (4), is configured to issue a signal that can be perceived by a user of the device (10) with one of his senses.

2. (currently amended) An opto-electronic device (10) as claimed in claim 1, ~~characterized in that~~ wherein the signaling means comprise a press button (5) which springs back after ~~[[it]] the press button~~ has been pressed, and which provides an experience for the tactile sense of the user when ~~[[it]] the press button~~ is pressed.

3. (currently amended) An opto-electronic device (10) as claimed in claim 2, ~~characterized in that~~ wherein the press button (5), upon being pressed, emits an acoustic signal that can be heard by the user.

4. (currently amended) An opto-electronic device (10) as claimed in claim 2, ~~characterized in that~~ wherein the press button (5) comprises a thin, bent membrane of steel.

5. (currently amended) An opto-electronic device (10) as claimed in claim 3, ~~characterized in that the device comprises~~ further comprising:
_____ a microphone (33) by means of which configured to convert the acoustic signal of the press button is converted to an electric signal.

6. (currently amended) An opto-electronic device (10) as claimed in claim 5, ~~characterized in that~~ wherein the electric signal is used to wake up the device from an energy-saving sleep mode.

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7. (currently amended) An opto-electronic device (10) as claimed in claim 2, ~~characterized in that wherein~~ the transparent block-shaped body of the first portion of the plate (V1) comprises a round, transparent, block-shaped body (6) which is attached onto the carrier plate (4), and the press button (5) comprises, in the center thereof, a round opening (5A) within which the round, transparent, block-shaped body (6) is situated, the upper face of said block-shaped body being substantially flush with an upper face of the press button (5), or being situated ~~so much lower as is~~ lower by an amount necessary to enable the press button (5) to be pressed.

8. (currently amended) An opto-electronic device (10) as claimed in claim 2, ~~characterized in that wherein~~ the transparent block-shaped body of the first portion of the plate (V1) comprises a ring-shaped, transparent, block-shaped body (6) which is attached onto the carrier plate (4), and the press button (5) is situated within the ring-shaped, transparent, block-shaped body (6) the upper face of which is substantially flush with an upper face of the press button (5).

9. (currently amended) An opto-electronic device (10) as claimed in claim 7, ~~characterized in that wherein~~, near a lower side of the transparent block-shaped body (6), the measurement radiation beam (S) is introduced into said transparent block-shaped body at an angle such that the measurement radiation beam (S) moves spirally to an upper side of the transparent block-shaped body (6).

10. (currently amended) An opto-electronic device (10) as claimed in claim 1, ~~characterized in that wherein~~ the dimensions of the first and second portions (V1, V2) of the plate are suitable for an object (M) that is formed by a human finger.

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11. (currently amended) An opto-electronic device (10) as claimed in claim 1, ~~characterized in that~~ wherein the laser (4) is attached onto the carrier plate (4) in such a manner that the resonant cavity of the laser is parallel to said carrier plate.

12. (currently amended) A method of measuring the movement of an object (M) relative to an input device (10), ~~characterized in that~~ wherein for this purpose use is made of an opto-electronic input device (10) as claimed in claim 1.

13. (currently amended) A method as claimed in ~~claim 10~~ claim 12, ~~characterized in that~~ wherein the object (M) is formed by a finger of a human user of the device.

14. (currently amended) A method of manufacturing an opto-electronic input device (10), wherein the input is formed by detected movements of an object (M), which input device is provided with an optical module (11) comprising at least one laser (4) with a resonant cavity for generating a measurement radiation beam (S), optical means (2) for guiding the radiation beam (S) to a plate (V) close to the object (M), and conversion means (C) for converting radiation from the measurement radiation beam (S), which is reflected by the object (M), into an electric signal, wherein the conversion means (C) are formed by the combination of the resonant cavity of the laser (4) and measurement means (3) for measuring a change in the resonant cavity during operation, which change is caused by interference of the reflected radiation from the measurement radiation beam (S) penetrating the resonant cavity and the standing wave in the resonant cavity, which is representative of a relative movement of the object (M) with respect to the module (11), wherein the optical module (11) is formed by a carrier plate (4) on which the laser (4) is mounted, and the optical means (2) are formed by an optical component (2), mounted on the carrier plate (4) and aligned with the laser (4), for the measurement radiation beam (S) emitted by the laser, which measurement radiation beam is guided from said location to the plate (V) close to the object (M),

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~~characterized in that wherein~~, near the object (M), the plate (V) is formed in two portions (V1, V2), ~~[[i.e.]] including~~ a first portion (V1) that comprises an upper surface of a transparent block-shaped body situated within a projection of the object (M), wherein the transparent block-shaped body (i) is designed so as to transmit the radiation beam (S) upon entering near a lower side and through multiple internal reflections against sidewalls of the transparent block-shaped body to the upper surface of the transparent block-shaped body and (ii) is arranged in a fixed position with respect to the carrier plate (4) in that the transparent block-shaped body is mounted onto the carrier plate, and a second portion (V2) situated within a projection of the object (M) is formed so as to be movable in a direction perpendicular to the carrier plate, wherein the second portion (V2) (4) and is provided with comprises signaling means which, ~~in the case of a response to movement of the second portion (V2)~~ in a direction perpendicular to the carrier plate ~~(4)~~, is configured to emit a signal that can be perceived by one of the senses of the user of the device.

15. (new) An opto-electronic device as claimed in claim 8, wherein, near a lower side of the transparent block-shaped body, the measurement radiation beam (S) is introduced into said transparent block-shaped body at an angle such that the measurement radiation beam (S) moves spirally to an upper side of the transparent block-shaped body.